Concordance and Diagnostic Accuracy of Tele-pathology Images in Gynecologic and Non-gynecologic Cytology Specimens

(As of October 2001)

Background:

Cytopathology is a vital and indispensable service in diagnostic medicine. Unfortunately, access to expert cytopathology services is not always available. The use of telepathology to transmit cytopathologic images to expert consultants has been widely used to improve access and render diagnoses, however, the diagnostic accuracy of these images may vary based on many factors including technical transmission quality, selection of images, and intra-observer and inter-observer interpretation discrepancies. The use of telepathology for this purpose is not well documented in the literature. Furthermore, published prospective studies have not been done.

Organization:

- Principal Investigator Dr. Judy Freeman
- Co-Investigators MAJ Christina Belnap MD, LTC Elaine Brent MD
- Project Manager Donald Hudson
- Technical Team Larry Damewood, Angelo Alvarez
- Science Dr. Leigh Jerome

Project Description:

Tripler Army Medical Center (TAMC) and other military medical facilities in the Pacific Region are linked via the Internet and telepathologic specimens are often sent for expert consultation. This project will prospectively assess the concordance and diagnostic accuracy of these telepathology images in non-gynecologic and gynecologic cytology specimens. Potential benefits of telecytology are improved patient quality of care and satisfaction through shorter turnaround time for diagnoses, cost savings from decreased shipping and handling costs, cost savings from avoidance of litigation related to inaccurate diagnoses of cytologic specimens, and improved education of cytotechnologists and pathologists at remote sites.

The objective of the present study is to prospectively determine the concordance and diagnostic accuracy rates of cervical cytology specimens and non-gynecologic cytology specimens in a standard risk population in Tricare Region 12. A second objective is to compare the concordance and diagnostic accuracy rates in the cervical cytology population versus the non-gynecologic cytology population.

Timelines:

To September 2000	Website development, equipment determination
October 2000	Acquire, install, and test equipment, submission of research protocol documents

November 2000	Imaging equipment determined unsuitable, research alternate equipment
January 2001	Evaluate and acquire alternate imaging equipment
April 2001	Research protocol determined to require informed consent, efforts to develop remote site consent process
June 2001	Consent process determined impossible due to "third hand" cooperation, project terminated
September 2001	Drafting and submission for publication of information paper

Deliverables:

- Determine the concordance rates of static tele-video cytology images and traditional "glass slide review" in gynecologic and non-gynecologic specimens.
- Determine the diagnostic accuracy of static tele-video cytology images with traditional biopsy specimens in gynecologic and non-gynecologic specimens.
- Compare the concordance and diagnostic accuracy rates between the gynecologic specimens and non-gynecologic specimens.

Summary:

The project researched and evaluated digital microscopy imaging systems, and an initially promising system proved to lack image quality. More research and evaluation uncovered a high quality, versatile, and economical imaging system. Research protocol review and approval processes determined that informed patient consent was required for project participation, and efforts to determine a remote site clinical workflow accommodating consent were unsuccessful. This resulted in a decision to terminate the project. An information paper was drafted describing the digital microscopy imaging system, and remote sites discovered uses other than microscopy for the equipment.

For more information, please visit http://peic.tamc.amedd.army.mil/